

GLUON
NETWORKS

ORIGINAL

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May 22, 2000

Magalie Roman Salas
Secretary
Federal Communications Commission
445 Twelfth St. SW
Washington, DC 20554

Re: CC Docket No. 98-147 ✓

Dear Madame Secretary,

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I had occasion to meet on May 17, 2000 with William Kehoe and Julie Patterson of the Common Carrier Bureau's Policy Division and Trent Harkrader and Darius Withers of the Enforcement Bureau's Market Disputes Division regarding CC Docket No. 98-148.

For purposes of the discussion I prepared a Powerpoint presentation, which I have attached. The presentation contains a summary of my personal credentials, which include 30 years of planning electronic (analog and digital) and optical systems for telephone loop applications. There is a brief statement about Gluon Networks, a privately held, Petaluma, CA-based Start-up Company, that is working on a system to facilitate the unbundling of loops by competitive local exchange carriers. (Commissioner Ness has visited Petaluma and is aware of the hotbed of Access Equipment development that is rampant here.) The rest of the material is a discussion of the vital importance of cageless collocation of multi-function systems to aid competition and loop unbundling in the smallest telephone central offices in the US (about 80% of the central offices in the US service fewer than 4,000 lines). The key doctrine that is advocated to lower the barriers to entry in these central offices is what I call "comparably efficient interconnection". The implementation of this doctrine is that a competitor should be able to process a local telephone call as efficiently and with as little impairment as an incumbent. Currently, incumbents switch calls within the central office so that a local call never has to leave the building. This is the lowest cost, highest quality alternative. Without the ability to switch calls within the same central office, a competitor is forced to accept the added cost of backhaul and added delay time inherent in processing a local call in a distant central office.

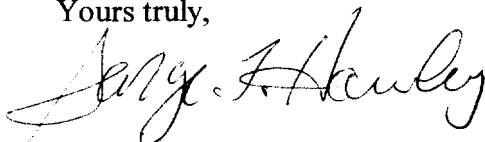
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The presentation material concludes with some ideas concerning how to remedy what I call the "fatal flaw" in the Telecommunications Act of 1996, the issue that, as incumbents place more optical fiber in the loop plant, there are fewer loops available to unbundled. Therefore, advancement of technology under the current industry structure reduces competition, especially for residential customers. My proposal suggests that the only remedy is to restructure the incumbents into 1) a regulated utility that provides central office building infrastructure and bandwidth for lease in the loop plant, including unbundled copper and 2) an unregulated competitive provider that leases loop bandwidth and central office space on the same terms as the current group of CLECs. SBC, Bell Atlantic and others appear to be re-organizing in this way, which reduces the structural issues, if true. It may also be possible to create a regulated bandwidth duopoly by restructuring the local cable monopolies along the same lines.

Today, the incumbents are motivated to slow the advance of competition at every turn, creating lots of work for the Enforcement Division. Under the structure advocated above, the bandwidth utilities are motivated to seek out more customers for their space and facilities, spurring competition in local access.

Please feel free to have someone contact me for any clarification.

Yours truly,

A handwritten signature in cursive script, reading "George T. Hawley".

George T. Hawley
President and CEO
Gluon Networks
1301 Redwood Way,
Petaluma, CA 94594

Telecommunications Act Implementation

George T. Hawley
Gluon Networks

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Topics

- Credentials
- Gluon Networks
- Telecomm Act of 1996-Collocation Issues
- Telecomm Act of 1996-the Fatal Flaw
 - A Proposed Remedy

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George Hawley Credentials


- BSEE Northwestern Univ. '60
- MEEE NYU '65
- PhD-EE Polytechnic Institute of Brooklyn '70
- Bell Telephone Labs-'63 to '83
 - Systems Engineering, Product Planning-Loop Range Extender, SLC-Series 5 Digital Loop Carrier System
- Bellcore-'84 to '87
 - Loop Technology and Optical Fiber System Requirements
 - Created GR-303 Integrated Digital Loop Carrier Interface
- Optilink Corp/DSC Communications-'87 to '95
 - Planned Litespan-2000 Optical Loop Carrier System, Starspan Fiber-to-the-Curb System
- Diamond Lane Communications/Nokia-'95 to '99
 - Planned Speedlink/D50 DSLAM
- Gluon Networks-'00
 - Working on MAGiX™ Integrated Access Gateway Switch for CLECs
- More than 50 Million US DLC Loops, more than 100K Global DSL lines

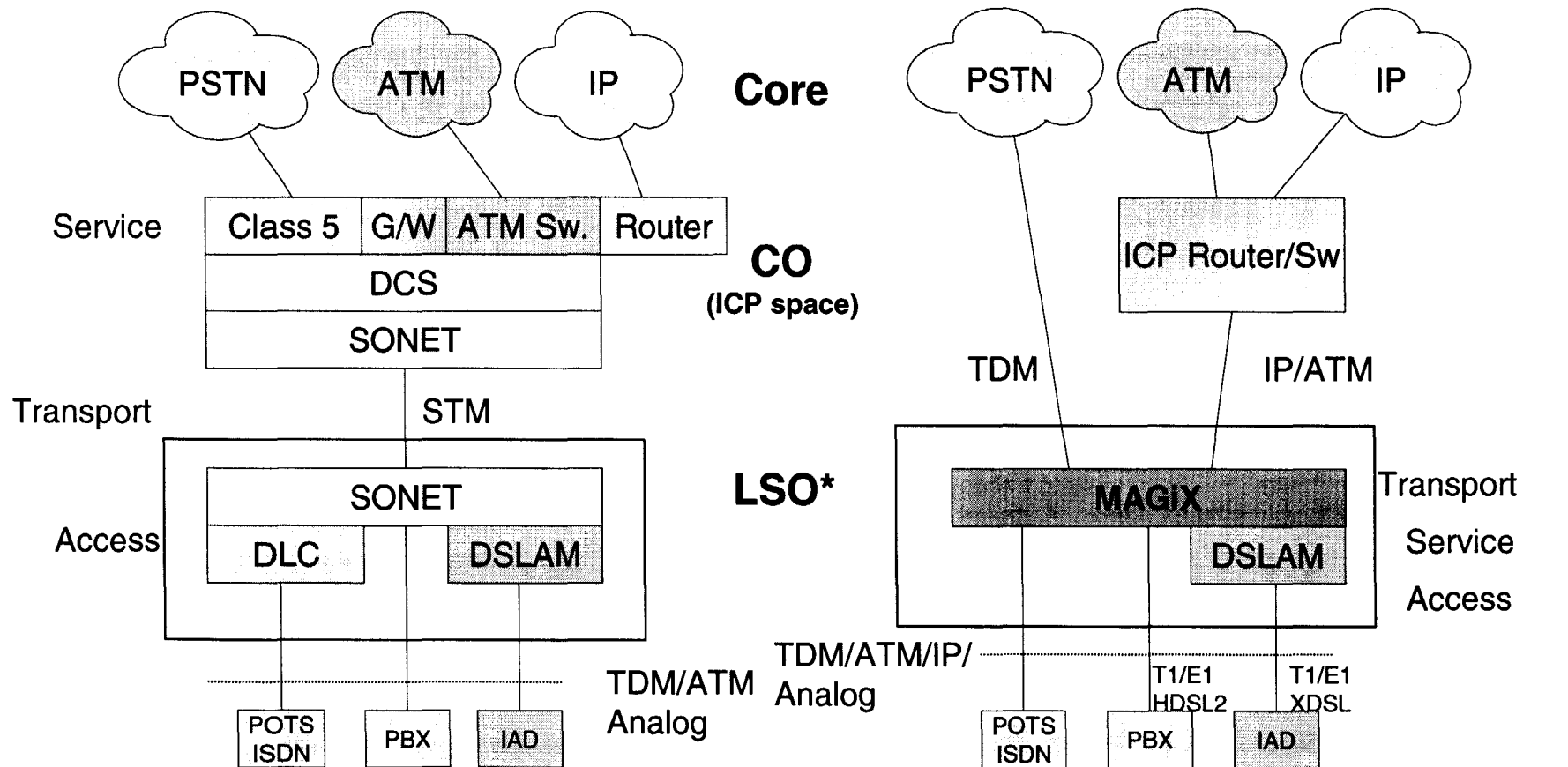
Gluon Networks: The Strong Force

- Gluon Networks is a privately held start-up company in Petaluma, CA
- Gluon's **MAGiX™** system provides a low-cost end-office in a single shelf of equipment with switching, multiplex, multiple line interface and packet gateway functions.
- The MAGiX system is optimized for telephone central office installation, worldwide, particularly cageless collocation where low installed first costs and environmental requirements are paramount.
- Gluon's ideal customers are ICPs that are collocated in ILEC Central Office space and that provide retail voice and data services to business and residence end users.

Gluon Collocation Model

Pushing the packet service layer to the LSO

Today  Tomorrow



* LSO = "leased space office"
(the telephone company central or end office)

Collocated Equipment Issues

Market Models for ICP Competition

The Importance of Collocation

CO Demographics and

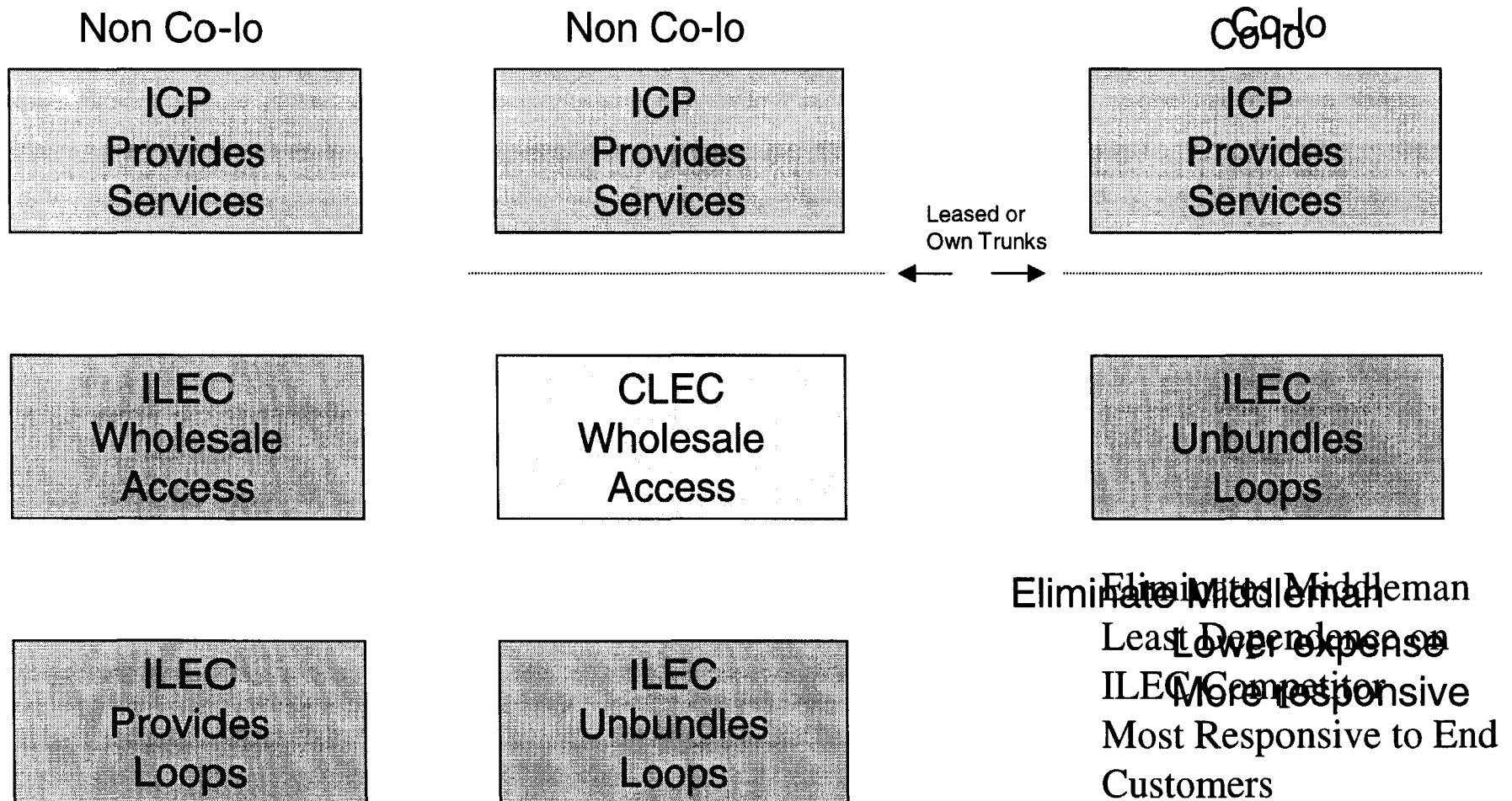
The Importance of Cageless Collocation

Voice Services

The Principle of 'Comparably Efficient Interconnection'

The Requirements for Integrated Functionality

Retail ICP Switching Markets



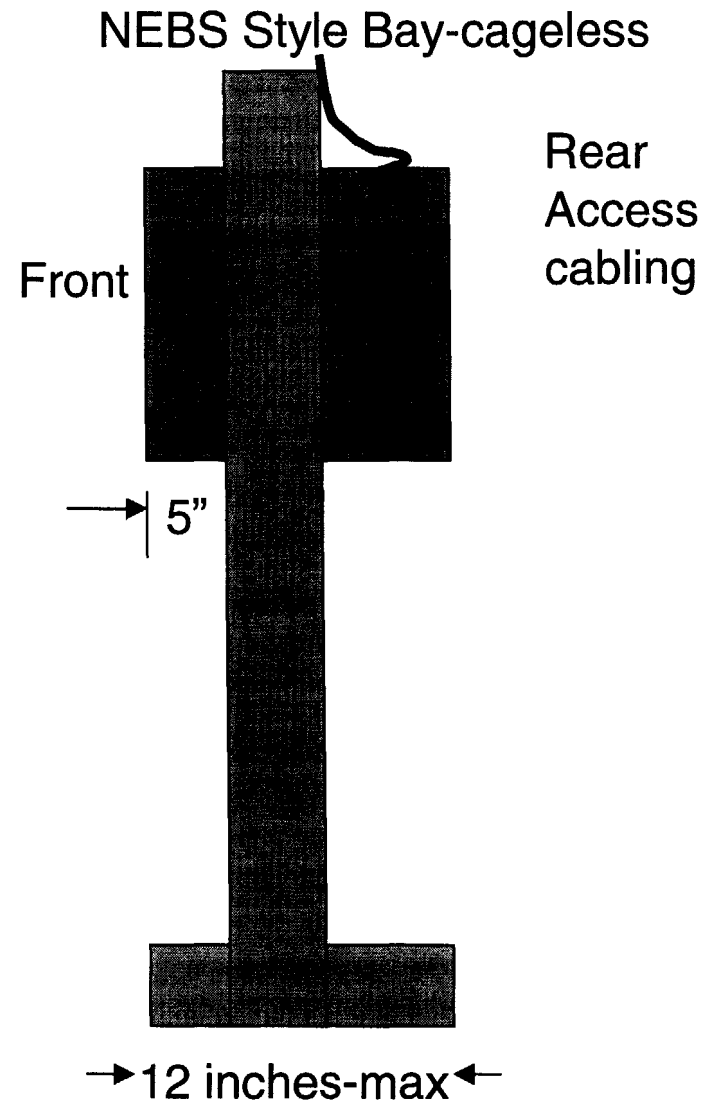
US CO Demographics

- 80% of RBOC lines in 20% of COs
 - Therefore, about 2000 COs > 55K lines average
 - 8000 COs ~3500 lines average
 - At less than 10% penetration per CO << 1 shelf required.
 - Therefore-multi-function, low cost, cageless co-lo mandatory in place of multiple single function legacy systems
- Non-Bell Market average CO size less than 4K lines-same requirements
- ETSI market dominated by many small exchanges, >95% of all offices probably less than 4K lines.

Conclusion: Most co-lo opportunities are small offices, requiring maximum efficiency: 1)cageless installation, 2)lowest cost system that Integrates multiple functions. Otherwise, Competition using directly Unbundled loops will be available only in the largest markets.

Cageless Collocation Considerations

- Collocation Cage >\$50K installed
 - 10' by 10' standard size
 - Front access to cabling best
 - **Overkill for most COs**
- Cageless collocation most economical, especially for small offices. With multifunction system, less than 1 bay required in most installations.
 - Rear access to cabling best in US
 - <800 watts, typical requirement
- Direct access to unbundled loop requires built-in loop test access
 - A backplane requirement
- ETSI requirement <11.5 inches deep
 - Front access cabling
- Conclusion-System must be optimized for cageless co-lo with flexible cabling for widest range of applications.



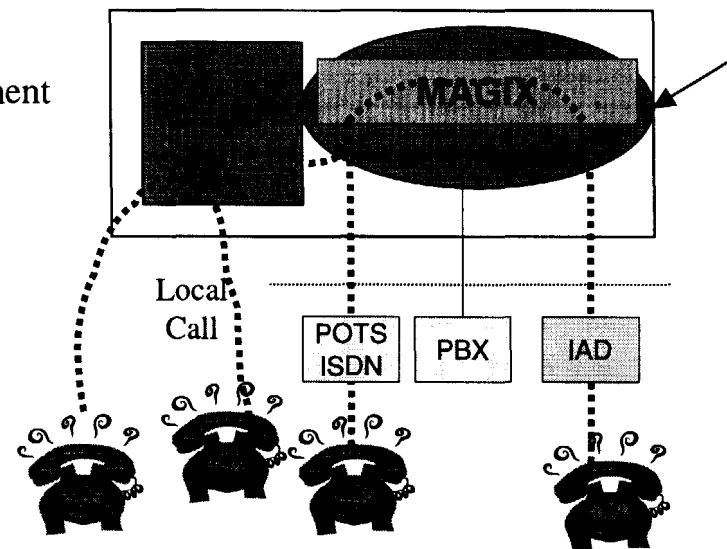
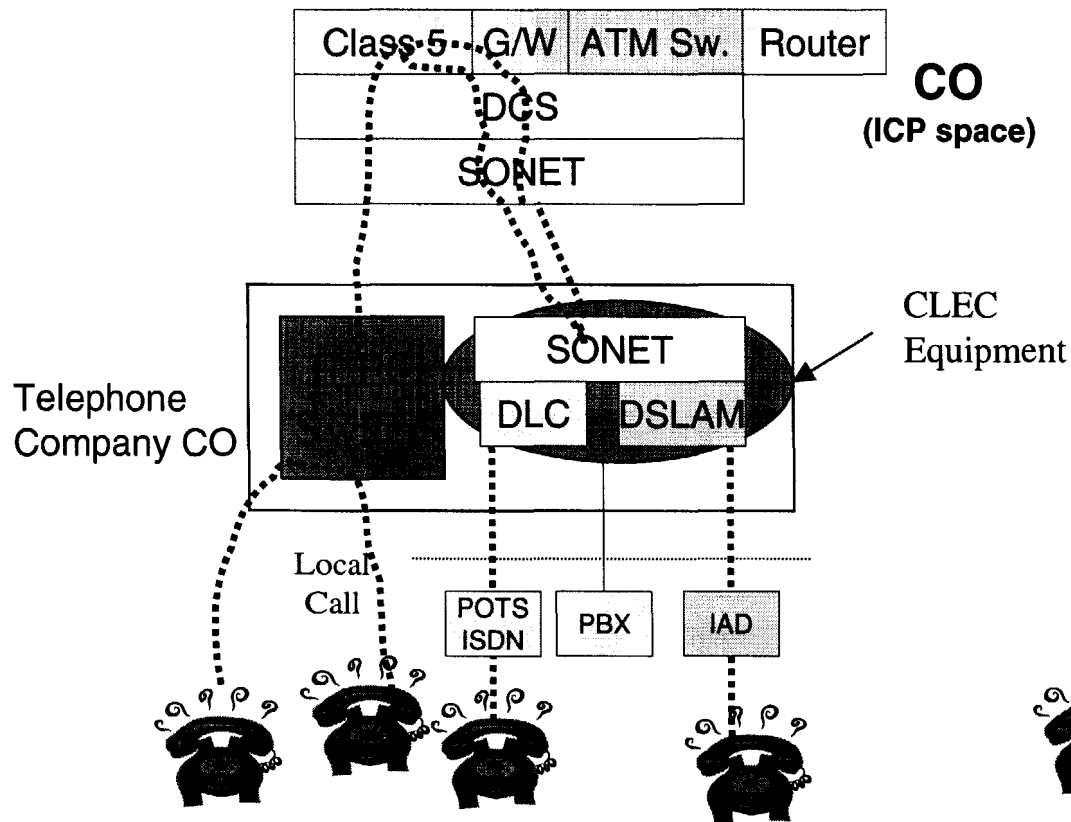
Voice Services

Comparably Efficient Interconnection

Simple Local Telephone Call

Today backhaul
required

Tomorrow no backhaul with
Integrated Gateway/Switch



CEI Levels the Playing Field

- Eliminating backhaul lowers cost of switched services for competitors
- Reducing number of interfaces and length of path improves performance quality and reliability
- CEI enables ICPs to compete on an even footing where unbundled loops are available

Unbundled LOOPS

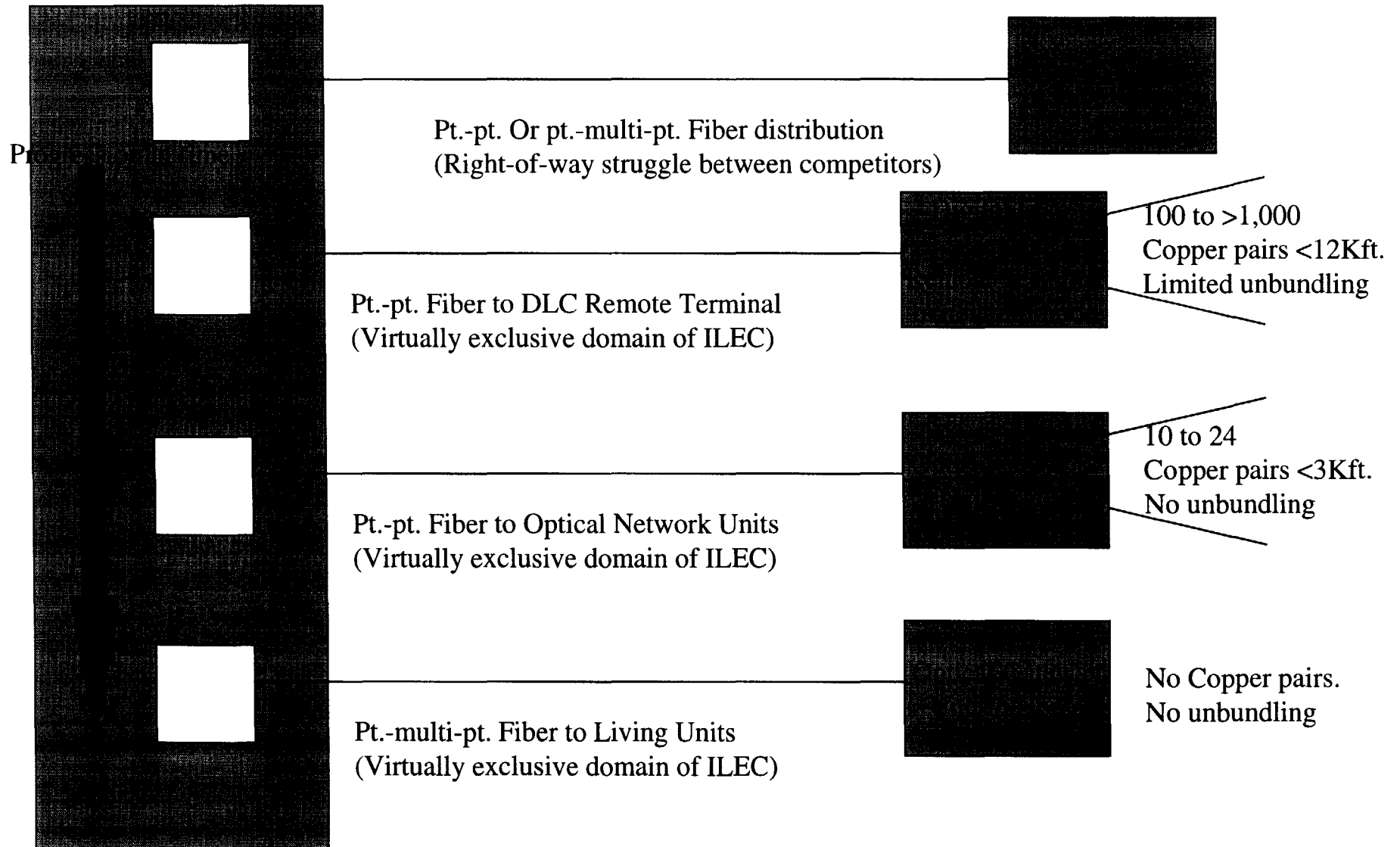
The fatal flaw in the
Telecommunications Act of 1996

Catch 22

- The Telecommunications Act of 1996 was intended to promote competition through access to unbundled loops and to promote the use of new technology (e.g. fiber optics) in US telephone access networks
- Issue—More fiber in the loop means fewer loops available to be unbundled which means less competition

Advancing Fiber Loop Technology

Retreating Unbundling Opportunities



Challenges to Competition in the Loop

- Limited right-of-way, especially in residential neighborhoods—One aerial pole line with limited capacity or pre-existing buried cables reducing opportunities to dig
- Extreme cost of building overlay networks-limited productivity gains in digging trenches-labor intensive
- Limited tolerance for disruption caused by construction, insightly proliferation of boxes
- Inelastic markets-neighborhoods tend to have fixed number of living units reducing attractiveness for 3rd, 4th, 5th competitor
- Unbundling not viable at outside plant copper terminations, especially as terminals get smaller.

Bandwidth Unbundling-A Possible Solution

- Break up the ILECs into a “Bandwidth Utility” and an ICP
 - Bandwidth utility owns outside plant cable and electronics and CO buildings-regulated because of use of public right-of-way
 - ICP owns switches in COs—becomes an unregulated CLEC
- Maybe break up cable companies in a similar way
- Open all loop technology to bandwidth unbundling and collocation in CO/Head end—Cable and telephone company bandwidth utilities become a local access duopoly, regulated by the states and required to provide access facilities, cable and collocation space to all service providers with the same price for same services.
- Bandwidth becomes a commodity, services and networking efficiency and reliability become the competitive playing field.

Technical Implications of Bandwidth Unbundling

ICPs need access to line interfaces

